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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/619,497	IWASAKI, MASAJIRO	
	Examiner	Art Unit	
	PATRICK A. DARNO	2169	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _01 December 2008_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-27_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-27_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _16 July 2003_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _07222008_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. No new claims have been added. No claims have been canceled. Claims 1, 5, 10, 12, 17, 19, and 23-24 have been amended. Claims 1-27 are pending in this office action.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-11 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

With respect to claim 1, the claim recites a method or process which fails to pass the machine-or-transformation test. The machine-or-transformation test set forth by the court in In re Bilski, 545 F. 3d 943 (C.A.Fed 2008), 88 U.S.P.Q. 1385 is an inquiry into two different factors. "[A]n Applicant may show that a process claim satisfies § 101 either by showing that his claim is tied to a particular machine, or by showing that his claim transforms an article." [In re Bilski]. It was set forth in Bilski that transformation of articles can be interpreted as the transformation of raw materials needed in a given art. The court determined that the raw materials in many "information-processes [comprises] electronically manipulated data."

It appears that Applicant's claim 1 fails the machine-or-transformation test set forth by the court in Bilski. There is no limitation tying the method or process to a particular machine, nor does there appear to be any transformation of data. Since Applicant's claim 11 fails the machine-or-transformation test, claim 1 is rejected under 35 U.S.C. 101.

Claims 2-11 are rejected because they fail to resolve the deficiencies of claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,240,424 issued to Kyoji Hirata (hereinafter "Hirata") in further view of U.S. Patent Application Publication Number 2005/0131951 issued to Hong-Jiang Zhang et al. (hereinafter "Zhang").

Claim 1:

Hirata teaches a method of classifying an image, comprising the steps of:

designating a number of query images to be extracted from a plurality of images stored in an image database in correspondence with feature data, the image database having each image stored in an image file corresponding to an image feature *(Hirata: column 5, lines 4-15 and column 5, line 66 – column 6, line 12 and Fig. 3 and Fig. 6)*;

a) extracting a query image from a plurality of images stored in an image database in correspondence with feature data *(Hirata: column 5, lines 58-65)*;

b) searching, according to a predetermined similarity level, for a representative image resembling the query image in a representative image classification database in which each group of images is represented by respective representative images *(Hirata: column 5, lines 36-40;*

Note that images are "classified under one primary object". Here the primary object is the representative image (See Hirata column 4, lines 66-67). Also note column 4, lines 7-8 and column 5, lines 58-65.);

c) registering the query image as a new representative image in the representative image classification database when no resembling representative image is found as a result of the search according to the predetermined similarity level *(Hirata: column 4, lines 1-14; This reference shows the steps for creating a new representative image. This would be done when an image does not fit into any category already determined.)*; and

d) adding the query image into a group represented by the resembling representative image found as a result of the search according to the predetermined similarity level *(Hirata column 4, lines 9-14 and column 7, lines 7-10)*; and

e) displaying one or more representative images in an order based on the predetermined similarity level *(Hirata: column 7, lines 7-13 and Fig. 9).*

Hirata fails to explicitly disclose:

displaying one or more representative images in an order based on the predetermined similarity level which is determined according to a distance inside a feature vector space; and

wherein the similarity level between the query image and the representative image increases as the distance between the two points is closer towards 0.

However, Zhang discloses:

displaying one or more images in an order based on the predetermined similarity level which is determined according to a distance inside a feature vector space *(Zhang: paragraph [0069], lines 1-6 and paragraphs [0078] – [0080] and paragraph [0094], lines 1-3 and at least claim 1 "__within a feature space...__")*; and

wherein the similarity level between the query image and the representative image increases as the distance between the two points is closer towards 0 *(Zhang: paragraph [0078], lines 11-12 and paragraph [0079], lines 1-3 and paragraph [0080], lines 1-4 and paragraph [0094], lines 1-3 and paragraph [0032], lines 1-3).*

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Hirata with the teachings of Zhang noted above. The skilled artisan would have been motivated to improve the teachings of Hirata per the above in order to improve accuracy in the retrieval of stored images *(Zhang: paragraph [0073], lines 3-4).*

Claim 2:

The combination of Hirata and Zhang teaches all the elements of claim 1, as noted above, and Hirata further teaches wherein the images in the image database are obtainable by referring to the respective representative images in accordance with the predetermined similarity level *(Hirata: column 5, line 58-column 6, line 1 and Fig. 5; Note that the primary object is the representative image as shown at column 4, lines 66-67.).*

Claim 3:

The combination of Hirata and Zhang teaches all the elements of claim 1, as noted above, and Hirata comprising a step of forming the groups into a hierarchical structure *(Hirata: Figs. 2A, 2B and also column 5, lines 38-40; Note in column 5, lines 38-40 states "classified under one primary object". This further shows the hierarchical structure of images under a representative image (here the primary object).)*, wherein the forming step further includes the steps of:

a) extracting a further query image from the representative images in the representative images classification database *(Hirata: column 5, lines 36-40; Note that images are "classified under one*

primary object". Here the primary object is the representative image (See Hirata column 4, lines 66-67). Also note column 4, lines 7-8 and column 5, lines 58-65.);

b) searching, according to a further predetermined similarity level, for a further representative image resembling the further query image in a further representative image classification database in which groups of images are represented by respective further representative images *(Hirata: column 5, lines 36-40; Note that images are "classified under one primary object". Here the primary object is the representative image (See Hirata column 4, lines 66-67). Also note column 4, lines 7-8 and column 5, lines 58-65.)*;

c) registering the further query image as a new further representative image in the further representative image classification database when no resembling further representative image is found as a result of the search according to the further predetermined similarity level *(Hirata: column 4, lines 1-14; This reference shows the steps for creating a new representative image. This would be done when an image does not fit into any category already determined.)*; and

adding the further query image into a group represented by the resembling further representative image found as a result of the search according to the further predetermined similarity level *(Hirata column 4, lines 9-14 and column 7, lines 7-10).*

<u>Claim 26:</u>

Claim 26 is rejected under the same reasons set forth in the rejection of claim 1.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirata in view of Zhang and further in view of U.S. Patent Application Publication Number 2003/0011683 issued to Fumitomo Yamasaki et al. (hereinafter "Yamasaki").

Claim 4:

The combination of Hirata and Zhang discloses all the elements of claim 3, as noted above, but does not explicitly disclose wherein the hierarchical structure is formed as layers of a directory of a file system for managing the images in the image database.

However, Yamasaki discloses wherein the hierarchical structure is formed as layers of a directory of a file system for managing the images in the image database *(Yamasaki: paragraphs [0087], [0089], and Fig. 9)*.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the previously mentioned combination with the teachings of Yamasaki noted above forming a directory structure of images *(Yamasaki: paragraph [0089])*. The skilled artisan would have been motivated to improve the previously mentioned combination per the above such that using the hierarchical structure, the user can readily sort out image data *(Yamasaki: paragraph [0091], lines 1-5)*.

5. Claims 5-7, 12-14, 19-21, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over NPL article titled "Recursive Space Decompositions in Force-Directed Graph Drawing Algorithms" written by K.J. Pulo (hereinafter "Pulo") in view of U.S. Patent Application 2003/0198384 issued to Michael Vrhel (hereinafter "Vrhel") and further in view of Zhang.

Claim 5:

Pulo discloses an image feature space display method comprising the steps of:

a) determining k representative points (k being an integer which is more than 1) in a feature space in response to a distance between points in the feature space and representative points representative of a plurality of feature spaces surrounding the feature space *(Pulo: Section 3.2 Finding The Characteristic Points, lines 39-40; Note that the k-means algorithm performs the all the same functionality described here. Section 2.2, lines 8-15 further describes the grouping of objects with respect to proximity and spatial location (distance).)*;

b) obtaining k sub-feature spaces by evenly allocating the points in the feature space into k representative points *(Pulo: Section 3.2 Finding The Characteristic Points, lines 41-43)*;

c) dividing a display space into sub-display regions of k segments, the display space being divided in a manner so that the sub-feature spaces correspond to the sub-display regions *(Pulo: Section 2.2 Recursive Space Decompositions (RSDs), lines 1-5; Note that this describes the function of an RSD. The k-means algorithm is a type of RSD (Section 2.2 Recursive Space Decompositions (RSDs), lines 41-45).)*;

d) repeating the steps a) through c) until the sub-feature spaces and the sub-display regions are divided into minimum units, respectively *(Pulo: Section 2.2 Recursive Space Decompositions (RSDs), lines 2-3 and Section 3.2 Finding The Characteristic Points, lines 43-45; These two citations display a clear reference to the recursive nature of the k-means algorithm which results in the repeating of steps a, b, and c.)*; and

Pulo discloses the k-means algorithm for carrying out the previous limitations cited above, and Pulo even suggests grouping of objects based on the spatial locations of regions of a graph segmented using the k-means algorithm *(Pulo: Section 2.2, lines 1-15 and section 3.2, lines 17-28)*, but Pulo does not explicitly disclose applying the k-means function for segmenting images, arranging each image included in a minimum unit of a sub-feature space to a corresponding one

of the minimum units of the sub-display region, and wherein the distance between the points in the feature space become shorter as similarity of images becomes greater.

However, Vrhel discloses applying the k-means function to images for the purpose of segmenting the image *(Vrhel: paragraph [0017], lines 6-9)*, e) arranging each image included in a minimum unit of a sub-feature space to a corresponding one of the minimum units of the sub-display regions *(Vrhel: paragraph [0018], lines 17-21)*.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Pulo with the teachings of Vrhel noted above. The skilled artisan would have been motivated to apply the teachings of Pulo per the above in order to classify individual pixels from an image into particular groups *(Vrhel: paragraph [0010], lines 1-4)*.

The combination of Pulo and Vrhel does not explicitly disclose wherein the feature space indicates at least one of a histogram feature, an edge feature, and a texture feature;

wherein the distance between points in the feature space become shorter in correlation to increase of similarity of images; and,

wherein the similarity of images increases as the distance between the two points is closer towards 0.

However, Zhang discloses:

wherein the feature space indicates at least one of a histogram feature, an edge feature, and a texture feature *(Zhang: paragraph [0078], lines 3-7)*;

wherein the distance between points in a feature space become shorter in correlation to increase to increase of similarity of images (*Zhang: paragraph [0069], lines 1-6 and paragraphs [0078] – [0080] and paragraph [0094], lines 1-3 and at least claim 1 "**within a feature space...**"*); and,

wherein the similarity of images increases as the distance between the two points is closer towards 0 *(Zhang: paragraph [0078], lines 11-12 and paragraph [0079], lines 1-3 and paragraph [0080], lines 1-4 and paragraph [0094], lines 1-3 and paragraph [0032], lines 1-3).*

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Hirata with the teachings of Zhang noted above. The skilled artisan would have been motivated to improve the teachings of Hirata per the above in order to improve accuracy in the retrieval of stored images *(Zhang: paragraph [0073], lines 3-4).*

Claim 6:

The combination of Pulo, Vrhel, and Zhang discloses all the elements of claim 5, as noted above, and Pulo further discloses wherein the display space is two dimensional *(Pulo: Section 2.2 Recursive Space Decompositions (RSDs), lines 13-15)*, wherein the feature space and the display space are divided into four sub-feature spaces and four sub-display regions in a grid manner *(Pulo: Section 2.2, lines 46-55 and Fig. 2)*, respectively, wherein the representative points are disposed proximally with respect to two feature spaces which are arranged adjacent to each other and tangent to the sub-feature spaces, and thus disposed distally with respect to two other feature spaces which are arranged adjacent to each other but not tangent to the sub-feature spaces *(Pulo: Fig. 2).*

Claim 7:

The combination of Pulo, Vrhel, and Zhang discloses all the elements of claim 5, wherein the display space is three-dimensional *(Pulo: Section 3.1 Description, lines 1-2; This reference suggests a handling a variable dimension space (d-dimensional).* So three dimensional must be one of the cases considered.), wherein the feature space and the display space are divided into eight sub-feature

spaces and eight display regions in a grid manner *(Pulo: Section 2.2, lines 16-30; The specific example chosen by Pulo is one that divides regions by 4. This is further seen in Fig. 2. However, in Section 2.2, lines 20-22, it is explicitly stated that irregular RSDs (like the k-means algorithm) "may divide space into arbitrarily sized and shaped regions at each level." This surely covers all types of sub-divisions, including where the feature space and display regions are divided by 8.)*, respectively, wherein the representative points are disposed proximally with respect to three feature spaces which are arranged adjacent to each other and tangent to the sub-feature spaces, and thus disposed distally with respect to three other feature spaces which are arranged adjacent to each other but not tangent to the sub-feature spaces *(Pulo: This can be seen with respect to two dimensions in Fig. 2. While a diagram is not given for an example of 3-dimensions, the references cited above in the rejection of this claim state that it would be possible to have a 3-dimensional space (d-dimensional) and divide by the sub-feature space and display region by 8 ("arbitrarily sized and shaped regions").)*.

Claim 12:

Claim 12 is a computer program product claim corresponding to method claim 5 and is rejected under the same reasons set forth in the rejection of claim 5.

Claim 13:

Claim 13 is a computer program product claim corresponding to method claim 6 and is rejected under the same reasons set forth in the rejection of claim 6.

Claim 14:

Claim 14 is a computer program product claim corresponding to method claim 7 and is rejected under the same reasons as set forth in the rejection of claim 7.

Claim 19:

Claim 19 is a computer program product claim corresponding to method claim 5 and is rejected under the same reasons set forth in the rejection of claim 5.

Claim 20:

Claim 20 is a computer program product claim corresponding to method claim 6 and is rejected under the same reasons set forth in the rejection of claim 6.

Claim 21:

Claim 21 is a computer program product claim corresponding to method claim 7 and is rejected under the same reasons set forth in the rejection of claim 7.

Claim 27:

Claim 27 is rejected under the same reasons set forth in the rejection of claim 5.

6. Claims 8-9, 15-16, and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pulo in view of Vrhel in view of Zhang and further in view of Hirata.

Claim 8:

The combination of Pulo, Vrhel, and Zhang discloses all the elements of claim 5, as noted above, but the combination does not explicitly disclose wherein the points in the feature space represent images in a representative image classification database which are subject to the steps of:

a) extracting a query image from a plurality of images stored in an image database in correspondence with feature data;

b) searching, according to a predetermined similarity level, for a representative image resembling the query image in the representative image classification database in which groups of images are represented by respective representative images;

c) registering the query image as a new representative image in the representative image classification database when no resembling representative image is found as a result of the search according to the predetermined similarity level; and

d) adding the query image into a group represented by the resembling representative image found as a result of the search according similarity level the predetermined.

However, Hirata discloses wherein the points in the feature space represent images in a representative image classification database, which are subject to the steps of:

a) extracting a query image from a plurality of images stored in an image database in correspondence with feature data *(Hirata: column 5, lines 58-65)*;

b) searching, according to a predetermined similarity level, for a representative image resembling the query image in the representative image classification database in which groups of images are represented by respective representative images *(Hirata: column 5, lines 36-40; Note that images are "classified under one primary object". Here the primary object is the representative image (See Hirata column 4, lines 66-67). Also note column 4, lines 7-8 and column 5, lines 58-65.)*;

c) registering the query image as a new representative image in the representative image classification database when no resembling representative image is found as a result of the search according to the predetermined similarity level *(Hirata: column 4, lines 1-14; This reference shows the steps for creating a new representative image. This would be done when an image does not fit into any category already determined.)*; and

d) adding the query image into a group represented by the resembling representative image found as a result of the search according similarity level the predetermined *(Hirata column 4, lines 9-14 and column 7, lines 7-10).*

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the previously mentioned combination with the teachings of Hirata noted above for the purpose of classifying and querying a database of images *(Hirata: Abstract).* The skilled artisan would have been motivated to improve the previously mentioned combination per the above such images could be classified to a group based on the similarity to a representative image of the group *(Hirata: column 4, lines 1-14).*

Claim 9:

The combination of Pulo, Vrhel, Zhang, and Hirata discloses all the elements of claim 8, as noted above, and Hirata further discloses comprising a step of forming the groups into a hierarchical structure, wherein the forming step further includes the steps of:

a) extracting a further query image from the representative images in the representative image classification database *(Hirata: column 5, lines 58-65)*;

b) searching, according a further predetermined similarity level, for a further representative image resembling further query image in a further representative image classification database in which groups of images are represented by respective further representative images *(Hirata: column 5, lines 36-40; Note that images are "classified under one primary object". Here the primary object is the representative image (See Hirata column 4, lines 66-67). Also note column 4, lines 7-8 and column 5, lines 58-65.)*;

c) registering the further query image as a new further representative image in the further representative image classification database when no resembling further representative image is found as result of the search according to the further predetermined similarity level *(Hirata: column 4, lines 1-14; This reference shows the steps for creating a new representative image. This would be done when an image does not fit into any category already determined.)*; and

d) adding the further query image into a group represented by the resembling further representative image found as a result of the search according to the further predetermined similarity level *(Hirata column 4, lines 9-14 and column 7, lines 7-10).*

Claim 15:

Claim 15 is a computer program product claim corresponding to method claim 8 and is rejected under the same reasons set forth in the rejection of claim 8.

Claim 16:

Claim 16 is a computer program product claim corresponding to method claim 9 and is rejected under the same reasons set forth in the rejection of claim 9.

Claim 22:

Claim 22 is a computer program product claim corresponding to method claim 8 and is rejected under the same reasons set forth in the rejection of claim 8.

Claim 23:

Claim 23 is a computer program product claim corresponding to method claims 1 and 9 and is rejected under the same reasons set forth in the rejection of claims 1 and 9.

7. Claims 10-11, 17-18, and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pulo in view of Vrhel in view of Zhang and further in view of U.S. Patent Application Publication Number 2003/0059121 issued to Andreas E. Savakis et al. (hereinafter "Savakis").

<u>Claim 10:</u>

Pulo discloses an image feature space display method comprising the steps of:

a) dividing a feature space into three sub-feature spaces, the three sub-feature spaces being composed two sub-feature spaces disposed within a prescribed radius with respect to two reference points in the feature space, and another sub-feature space other than the two sub-feature spaces *(Pulo: Section 3.2 Finding The Characteristic Points, lines 39-40; Note that the k-means algorithm performs the all the same functionality described here. Section 2.2, lines 8-15 further describes the grouping of objects with respect to proximity and spatial location (distance). Further note that Pulo discloses dividing into a k (variable) amount of subsections.)*;

b) dividing a display space into sub-display regions of three segments, the display space being divided a same manner as the feature space so that the sub-feature spaces correspond to the sub-display regions *(Pulo: Section 2.2 Recursive Space Decompositions (RSDs), lines 1-5; Note that this describes the function of an RSD. The k-means algorithm is a type of RSD (Section 2.2 Recursive Space Decompositions (RSDs), lines 41-45).)*;

c) repeating the steps a) and b) the sub-feature spaces and the sub-display regions are divided into minimum units, respectively *(Pulo: Section 2.2 Recursive Space Decompositions (RSDs), lines 2-3 and Section 3.2 Finding The Characteristic Points, lines 43-45; These two citations display a clear reference to the recursive nature of the k-means algorithm which results in the repeating of steps a, b, and c.)*; and

Pulo discloses the k-means algorithm for carrying out the previous limitations cited above, and Pulo even suggests grouping of objects based on the spatial locations of regions of a graph segmented using the k-means algorithm *(Pulo: Section 2.2, lines 1-15 and section 3.2, lines 17-28)*, but Pulo does not explicitly disclose applying the k-means function for segmenting images, arranging each image included in a minimum unit of a sub-feature space to a corresponding one of the minimum units of the sub-display region.

However, Vrhel discloses applying the k-means function to images for the purpose of segmenting the image *(Vrhel: paragraph [0017], lines 6-9)*, e) arranging each image included in a minimum unit of a sub-feature space to a corresponding one of the minimum units of the sub-display regions *(Vrhel: paragraph [0018], lines 17-21)*.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Pulo with the teachings of Vrhel noted above. The skilled artisan would have been motivated to apply the teachings of Pulo per the above in order to classify individual pixels from an image into particular groups *(Vrhel: paragraph [0010], lines 1-4)*.

The combination of Pulo and Vrhel does not explicitly disclose wherein the feature space indicates at least one of a histogram feature, an edge feature, and a texture feature, wherein the distance between two points in the feature space become shorter in correlation to increase of similarity of images; and wherein the similarity of images increases as the distance between the two points is closer towards 0.

However, Zhang discloses:

wherein the feature space indicates at least one of a histogram feature, an edge feature, and a texture feature *(Zhang: paragraph [0078, lines 3-7])*,

wherein the distance between two points in the feature space become shorter in correlation to increase of similarity of images *(Zhang: paragraph [0078], lines 11-12 and paragraph [0079], lines 1-3 and paragraph [0080], lines 1-4 and paragraph [0094], lines 1-3 and paragraph [0032], lines 1-3 and at least claim 1 "**within a feature space...**")*; and

wherein the similarity of images increases as the distance between the two points is closer towards 0 *(Zhang: paragraph [0078], lines 11-12 and paragraph [0079], lines 1-3 and paragraph [0080], lines 1-4 and paragraph [0094], lines 1-3 and paragraph [0032], lines 1-3)*..

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the previously mentioned combination with the teachings of Zhang noted above. The skilled artisan would have been motivated to improve the previously mentioned combination per the above in order to improve accuracy in the retrieval of stored images *(Zhang: paragraph [0073], lines 3-4)*.

The combination of Pulo, Vrhel, and Zhang does not explicitly disclose dividing the feature space and the display space into specifically three subsections. However, Savakis discloses using the k-means function to divide subject matter into three subsections *(Savakis: paragraph [0082], lines 2-4)*.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the previously mentioned combination with the teachings of Savakis noted above. The skilled artisan would have been motivated to improve the previously mentioned combination because Pulo specifically suggests that the subdivisions produced by the k-means algorithm (an irregular RSD) may divided subject matter into any arbitrary size and shape *(Pulo:*

Section 2.2, lines 20-22; Therefore a larger shape results in less subdivisions and larger shape results in more subdivisions. This leaves selecting 3 subdivisions as a design choice.).

Claim 11:

The combination of Pulo, Vrhel, Zhang, and Savakis discloses all the elements of claim 10, as noted above, and Pulo further discloses wherein the reference points are selected from points disposed nearest to representative points included in the two sub-feature spaces *(Pulo: Section 3.2, lines 39-43 and Section 2.2, lines 8-15).*

Claim 17:

Claim 17 is a computer program product claim corresponding to method claim 10 and is rejected under the same reasons set forth in the rejection of claim 10.

Claim 18:

Claim 18 is a computer program product claim corresponding to method claim 11 and is rejected under the same reasons set forth in the rejection of claim 11.

Claim 24:

Claim 24 is a computer program product claim corresponding to method claim 10 and is rejected under the same reasons set forth in the rejection of claim 10.

Claim 25:

Claim 25 is a computer program product claim corresponding to method claim 11 and is rejected under the same reasons set forth in the rejection of claim 11.

Response to Arguments

Argument #1

Applicant Argues:

Initially, the Office Action states that the IDS submitted on July 22, 2008 were not considered "because the references could not be found by the Examiner." Reconsideration is respectfully requested, however, because PTO's PAIR database shows that the references were received by the PTO, as does the PTO-stamped post card that was returned to the Applicant.

Examiner Responds:

The documents which were part of the IDS submitted on July 22, 2008 have been received. The Examiner notes that only portions of the documents have been translated, while the majority of the documents remain in a foreign language. Because the Examiner is unable to read the foreign language, only the portions of the documents translated to English have been considered. The remaining portions of the documents may, or may not, be relevant to the Applicant's claims.

Argument #2

Applicant Argues:

Zhang does not, however, disclose that the images are displayed "in an order based on the predetermined similarity level." In Zhang, the highest ranking images are returned to the user as a "preferred results set." Id. The classification by Zhang's ranking module 216 is merely categorical in nature, and the individual images in the "preferred results set" are not displayed in any particular order.

Examiner Responds:

Examiner is not persuaded. Zhang discloses wherein the images are displayed based on a predetermined similarity level [Zhang: paragraph [0069], lines 1-6 and paragraphs [0078] – [0080]]. The Examiner is interpreting "an order based on the predetermined similarity level" to be any order that is determined before the displaying of the images. Here Zhang ranks the images according

to each of the images relevance to the submitted query, and then "**returns the images in rank[ed] order**" [Zhang: paragraph [0069]]. As a result, paragraph [0069] of Zhang stands in direct contrast to the Applicant's alleged assertion above that the results of Zhang "are not displayed in any particular order." Zhang: paragraph [0069] clearly shows this alleged assertion to be unsupported by fact.

Since it appears that each and every element of the Applicant's claimed invention is either disclosed or suggested by the prior art of record, the claims remain rejected under the reasons set forth in the preceding office action.

Argument #3

Applicant Argues:

Moreover, Zhang does not teach or suggest a similarity level that increases as the distance between two points in a vector space is closer towards 0. Zhang's distance calculator 214 does not meet this element, because it does not describe a variable similarity level that increases as the distance between two points in vector space decreases. The ranking module 216 does not meet this element, because it merely orders the images so that a sub-set can be displayed. In paragraph [0094], Zhang does describe that each image is represented as a vector in a feature space, but this is in reference to the positive feedback process implemented by the relevance feedback monitor 220.

Though Zhang does contain distance calculations and vector calculations, these elements do not teach a similarity level that increases as the distance between two points in vector space is closer towards 0.

Examiner Responds:

Examiner is not persuaded. Zhang discloses a similarity level that increases as the distance between two points in a vector space is closer towards 0 [Zhang: paragraph [0078], lines 11-12 and paragraph [0079], lines 1-3 and paragraph [0080], lines 1-4 and paragraph [0094], lines 1-3 and paragraph [0032], lines 1-3].

First, it is noted that Zhang discloses a distance calculator which calculates or measures the distance between the features of a feedback image and the features of a candidate image

[Zhang: paragraph [0079], lines 1-3]. Furthermore, Zhang explicitly recites that the "closeness in features between two images" is taken into account when ranking images [Zhang: paragraph [0079], lines 3-4]. It therefore follows when two images have features that are "closer" to each other, these two images are a better match than two images wherein the features are a further distance apart.

Since Zhang explicitly recites taking into account the "closeness" of features between a first image and a second image, it follows that Zhang also discloses a higher rank [similarity level] to images when the "closeness" of features approaches zero, because as two objects move towards each other, the distance between them gradually approaches zero. In Zhang, a perfect match would have a distance between features of 0, while the worst match would have a distance between features of ∞ [infinity].

Since it appears that each and every element of the Applicant's claimed invention is either disclosed or suggested by the prior art of record, the claims remain rejected under the reasons set forth in the preceding office action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK A. DARNO whose telephone number is (571)272-0788. The examiner can normally be reached on Monday - Friday, 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ali can be reached on (571) 272-4105. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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12-10-2008

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